Selection of Sponsor and Institution

1 Selection of Institution

The institution and sponsors of my proposal provide the best setting to successfully complete my research aims and prepare for an academic research career. In order to achieve my career goals, I must develop statistical and scientific skills as well as collaborative and professional skills. The Harvard T.H. Chan School of Public Health is an institution that has both leading academic departments and a collaborative emphasis. It provides access to computing with support courses, literature access, grant writing workshops and other academic resources that allow for the efficient execution of research projects. The Department of Biostatistics offers exceptional training under leaders in the field. The coursework has provided me with a statistical foundation in both theory and methods.

The Harvard Chan School is situated in a larger academic network of top teaching and research hospitals which have strong collaborative ties to the department. This allows for access to scientific interactions with top researchers, such as during my third year when I was able to take a course in human genetics at Harvard Medical School from the field's innovators like Dr. George Church. This network also guides our research to be translational and relevant to clinical needs. For instance, I have initiated collaborations at McLean Hospital to gain experience in applying integrative genomic methods and network analyses to post-traumatic stress disorder. Dr. Quackenbush's collaborations have allowed me the opportunity to attend Dr. Ed Silverman's weekly meetings at the Channing Institute (Brigham and Women's Hospital) on research in COPD. These meetings include discussions of both approaches being used to analyze the genomics of COPD and results of genomic analyses. This strong, longstanding collaboration with the Channing will be critical in guiding my proposed research in lung diseases to have accurate scientific interpretation and to have clinical relevance.

2 Selection of Sponsor

Both of my sponsors are leading experts in methodological research with experience in collaborations on lung diseases. Dr. John Quackenbush has an extensive background in network analysis for genomics and high dimensional data. Dr. Quackenbush has discovered fundamental roles played by gene expression variation in downstream biological phenotypes. He maintains a lab with students and postdocs that meet weekly to discuss their projects, many of which also utilize network approaches, consider the regulatory role of gene expression and apply their research to COPD. Dr. Quackenbush emphasizes formulating scientifically interesting and clinically relevant questions. This has been demonstrated throughout his long publication history of applied methods, which have been utilized by others in research settings. He is in firm support of the proposed research and encourages me to engage in the research by presenting regularly at research group meetings and speaking regularly with scientific experts. He is assisting in developing my skill set so that I can have a successful academic research career, such as by providing training in clearly communicating science via engaging presentations and writing for scientific journals.

Dr. Xihong Lin provides an exceptional background in statistical theory, particularly for genomics applications. She has extensive experience in both collaborative and methodological statistical research. Dr. Lin consistently publishes rigorous statistical methods in top statistical journals as well as collaborative analyses. Her group provides a theoretical statistical perspective that ensures that methods developed are statistically sound and efficient. The group also holds journal clubs to stay up to date on the status of the field and incorporate new ideas into projects. Dr. Lin's mentorship has included developing feasible training plans that balance developing the novel statistical methods while leveraging the simplicity of existing methods. She has emphasized the importance of staying current in the field, such as recommending recent publications and supporting attendance at major conferences to present and discuss projects. Each of my sponsors ensure that their students receive support and guidance throughout their training, with the goal of developing trainees into successful independent researchers.